Study Note

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The Impact and Challenges of Teachers' Professional Development Training of Mathematics at Primary School Level in Nepal

Krishna BHUJEL

Naruto University of Education

Abstract

Teachers' Professional Development (TPD) has been realized as powerful approach to implement child- friendly activity-based education in the twenty-first century. This study was carried out to investigate the impact of in-service teacher training of mathematics at primary school level and its challenges to implement in classroom teaching. For this purpose, a training workshop was conducted entitled with the multiplication of fraction in Grade 5 and was observed the classroom teaching either they can apply or not. The research design was an exploratory qualitative methodology of descriptive nature on the basis of the survey. The sample for the study was forty (40) primary mathematics teachers selected by purposive random sampling. The instrument used in this study was a 4 and 5-point Likert structural questionnaire with options. Furthermore, classroom observation, focus group discussion and video recording were also conducted. The findings showed that lack of relevant teaching skills, teacher's actions and attitudes, instructor's abilities, teaching learning materials and others teacher's beneficiaries, biasness of teachers evaluation, insufficient teaching-learning materials affect the active participation in training workshops and implementation of training into the classroom teaching. It was suggested that 1) training curriculum should be made on the basis of teachers' real needs, 2) training should be delivered by using hands-on teaching learning materials and 3) It is better to apply in-school training through lesson study approach. If the stakeholders such as education policy makers, Instructors, teachers and parents etc. fulfilled their own responsibilities and duties, it would be possible to intend to apply training contents in the classroom.

Keywords: Teacher training, Motivation, mathematics teaching, participation, intent to apply.

1. Introduction

1.1 Background

TPD is the body of systematic activities to prepare teachers for their job, including initial training, induction courses, in-service training and continuous professional development within school settings. Teacher development is an ongoing process through which teachers keep growing with their own voluntary effort. A facilitator can help teachers realize that 'they have the potential within themselves to become better teachers through deepening their own understanding and awareness of themselves and their learners. TPD is an approach that enables teachers to realize change and act as change agents. Teachers through TPD develop their competences. Competence is an integrated form of knowledge, skill, attitude and behavior. The main intent of the TPD program is to refresh, strengthen and update the knowledge and skills of teachers so that there will be visible change

in the classroom and help for the improvement of learning achievement (Guskey, 2002). Thus TPD is an essential for teachers to transform learning. We cannot deny the contribution of teacher training to teachers' professional development. It plays a prominent role in teachers' professional development. But, the teachers on-the-ground usually perceive that teacher training and teacher professional development program are synonymous.

Training is one of the most practical and direct approach to TPD. Training is a strategy for direct intervention by the collaborator, to work on specific aspects of the teacher's teachings. The main assumption of training is that teachers will improve their effectiveness in the classroom after mastery of discrete aspects of skills and knowledge. Thus, teacher training is the most popular approach of professional development and mostly ensured to be implemented in the classroom. One reason why training serves as an excellent means of staff development is that it compels teachers to reflect on and revitalize their thinking about teaching, and thereby inevitably subject their own reaching behavior to scrutiny. Thus training is most powerful option of TPD which is most commonly used in many countries including Nepal (Shrestha, 2008).

The essence of TPD in Nepal has instrumented by policy in 1971 by including professional qualifications of teachers in addition to academic qualifications. The government of Nepal has been launched different types of educational programs for the last four decades in order to achieve quality education by promoting teachers' academic and professional qualification. School Sector development Plan (SSDP, 2016-2023) has been launched by the ministry of education, which also aims to provide quality education, increase access to school enrollment and build up teachers' professional through different kinds of "Teachers' training." Now, In-service Teacher Training is renowned as Teachers' Professional Development (TPD) Training in Nepal. National Center for Educational Development (NCED) was established in 1993 under the Ministry of Education, Nepal with a view to provide teachers professional development opportunity formally to the teachers as an in-service teacher training program. The current effort of teachers' professional development in Nepal is primarily a need-based rather than imposition of what particular experts decided as one-fits-for-all. The physical progress report is incredibly accomplishing with a satisfaction rating of 98.02% school level teachers were trained (including teachers with qualifications from faculty of education). The successfulness in terms of implementation in the classroom is realized as challenging. The application of training skills in the classroom is partially achieved for both teachers and schools (NCED, 2009).

The efforts have been made to bring change in teacher education and teaching/learning culture. TPD training focuses on teachers' self-innovation and continuous learning. The teachers are now taken as assets, having a lot experiential knowledge and get short-term need based training guided by growth model. TPD training has two modules, each of 15 days which are divided into two parts: First, ten days training workshop which is face to face based on the training materials designed by trainers/ roster trainers at Education Training Centre; Second, five days school based self-study exercise, a project based, when every teacher makes and implements their teaching improvement plan and performs and writes reports of two assigned tasks – either project works or action researches - based on their needs; and instructional counselling which is an on-site support to the teachers. The same design of training is prescribed for second modules (TPD framework, 2015).

Different researches such as Research Center for Educational Innovation Development CERID (2005) and Department of Education (2006) show that the application of training content in the classroom is around 50%.

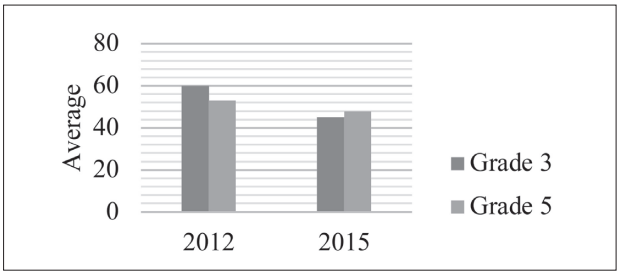

Figure 1: Nastional Assessment of Student Achievement in Mathematics.
Source: Department of Education (2017)

Fig.1 shows that it is urgent to improve students' achievement in Mathematics in the National Assessment of Students Achievement (NASA) of Grade 3 reports 2012 and 2015 shows that the average

achievements 60 and 45 respectively and Grade 5 reports 2012 and 2015 showed the average achievements 53 and 48 respectively.

1.2. The general objectives of this study

Therefore, the objectives of this study are; to explore the factors that make trainees passive participate in the training workshop, to find out the reasons why the contents of teacher training are not employed in the classroom teaching and to suggest the appropriate ways to make participants employ the contents of training in classroom.

1.3. Research questions

The research questions were; what are the factors that make the trainees passive participate in the training workshop? What are the reasons why training is not employed in the classroom teaching? How can make trainees actively participate in the training workshop? And what are the appropriate ways to employ the contents of training in classroom teaching?

2. Theoretical framework

The framework for identifying the factors for active participation in training workshop and implementation in the classroom teaching that was used in this study is the Self Determination Theory (SDT) of Motivation. This theory states that people's behavior can be intrinsically motivated or extrinsically motivated depending on the reasons for their involvement in a given task. Intrinsic motivation refers to engaging in an activity for the inherent enjoyment and pleasure derived from it, without the mediating effects of external rewards or pressures, and it is considered as the most self-determined type of motivation. On the other hand, extrinsic motivation concerns the participation in a task for contingent outcomes and not for the internal satisfaction derived from the task itself (Ryan & Deci, 2000a, 2000b, 2009).

Some of the teachers may recognize themselves as competent, but others may perform their work tasks because of external pressures or benefits related with the work. Intrinsically motivated teachers can be engaged in for the pleasure or the satisfaction derived from their own performance (for example knowledge, responsibility, recognition, accomplishment etc.). Extrinsically motivated teachers are serving/teaching by the nature of the workplace (system, rewards, salary and other benefits). In other words, they are not performing for the activity themselves, they are involved in their tasks according with immediate benefits.

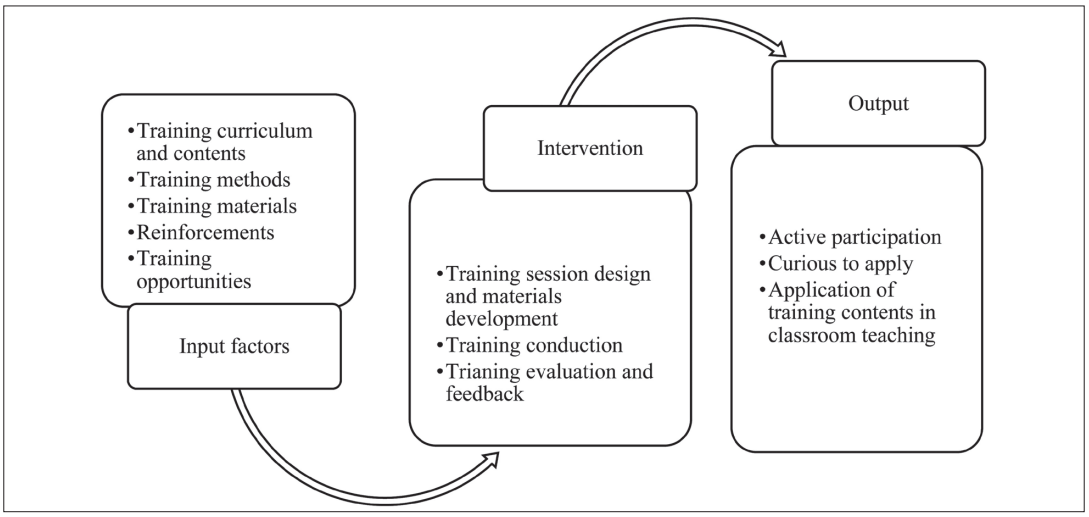

Figure.2, Theoretical framework: SDT of motivation
Source: Ryan, R.M., & Deci, E. L. (2009).

This study is focused on intrinsic motivation. If training is conducted by addressing teachers' real problems, using appropriate teaching methods, using relevant teaching materials, providing equal opportunities of trainings to all teachers, continuous supervising and fair evaluation, then the teachers will be intrinsically motivated and intend to apply training contents in classroom teaching. In this study, to what

extent intrinsic motivation of trainees related to training of mathematics are formed through previous TPD trainings will be analyzed by employing the following methodology.

3. Purpose and Methodology

3.1 Sampling

The 40 primary mathematics teachers, who belong to a province of Nepal (not capital city), and attended in the first phase and second phase of TPD training, were respondents of study.

3.2 Research tools

This study uses an exploratory qualitative methodology of descriptive nature. Questionnaires, semi-structured interviews, focus group discussion and video recording were applied as research tools for data collection.

3.3 Analysis

The author implemented a survey by filling the survey questionnaire on the basis of the Likert scale for the first time and then took an interview with all respondents. The interview questions were open-ended, such as; why the teachers do not want to participate actively in the training workshop? Why some teachers do not to apply the training in classroom teaching? What do you want to suggest to the Education Training Center (ETC) and teachers? The author recorded the video of each interview answers and made the transcripts of those answers and coded and analyzed them. Moreover, there were used primary data such as ETC's record files and as secondary data; annual report of ETC and schools' bulletins, NASA reports, previous research papers were analyzed to find out the impact and issues of teachers' training.

4. Results and Discussion

4.1 The most difficult topics in mathematics at primary level.

At first, the author wanted to know which topic is very difficult to teach for the teachers. So, the questions were asked through the questionnaire. In the Fig. 3, we can be seen 73% of teachers are feeling very difficulties in teaching fraction especially in multiplication of fraction. Therefore, the author decided to conduct a training workshop in multiplication of fraction of Grade 5.

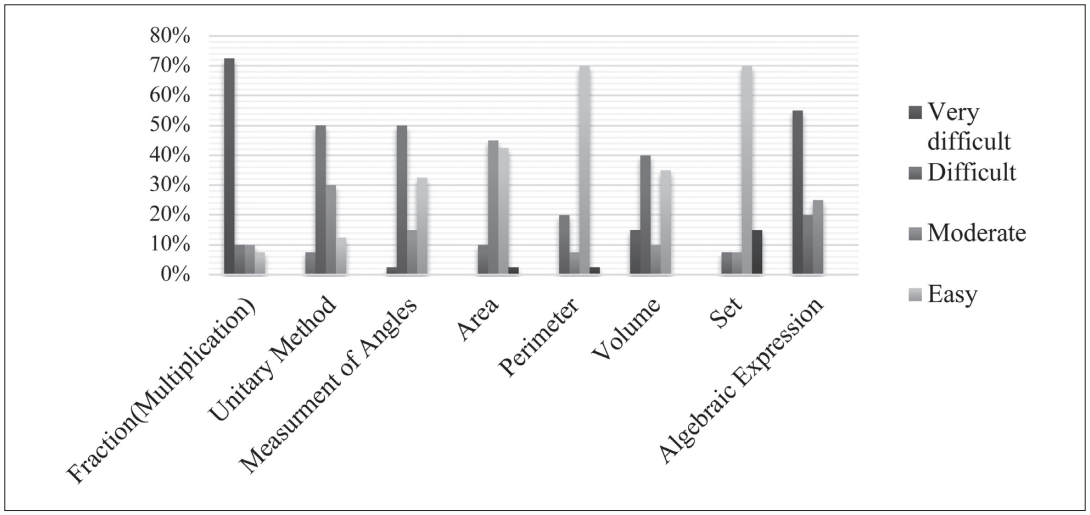

Figure 3: Difficulty levels of units
Source: made by the author

4.2 The training curriculum and contents are focused on Students' and teachers' needs.

Every training curriculum and content should be made from teachers' real needs and altogether with students' needs. So, the author asked to the teachers such as: Are the training curriculum and content are focused on students' and teachers' real needs? But most of the teachers expressed as disagree and strongly disagree. In the given Fig.4 shows that strongly disagree teachers are 16 and disagree

teachers are 14 out of forty teachers. From these expressions of the mathematics teachers, it is found that mathematics curriculum and training contents are not completely made on the basis of teachers' and students' real needs.

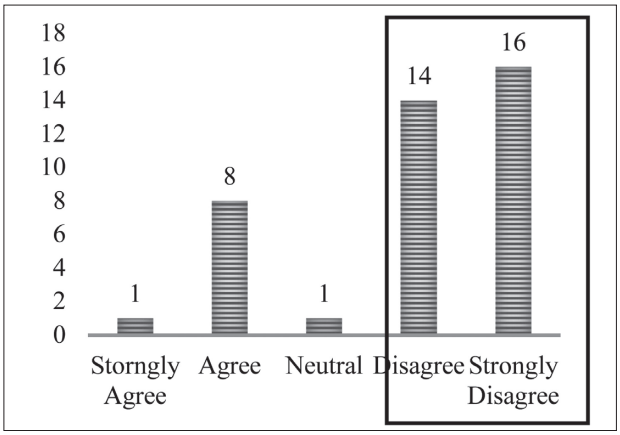

Figure 4: Teachers' opinion on training curriculum and contents.
Source: made by the author

4.3 Training delivery methods and training materials.

The author asked the teachers, the training delivery which is being conducted in the training workshop, is acceptable? The training delivery methods which are learnt from training workshops, can be easily used in the classroom teaching? Fig.5 shows that 20 teachers are disagree and seven teachers are strongly disagree out of forty teachers. So, training delivery methods are not useful to apply in classroom teaching.

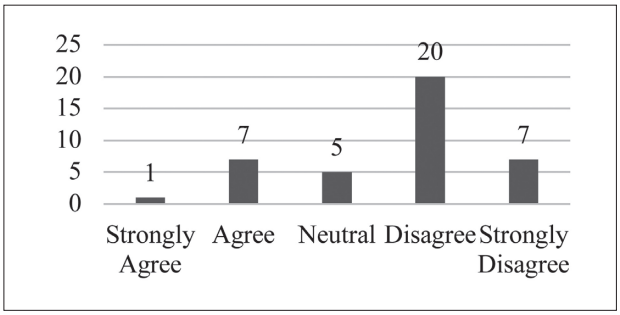

Figure 5: Teachers' opinion on training delivery
Source: made by the author

4.4 Instructors are updated and competent in subject matter

Instructors should be competent and updated in their subject matter. When the author collected the opinion from trainees about instructors are updated and competent in their subject matter. Most trainees have disagreed with that statement. Fig.6 shows that twenty-five teachers disagreed and seven teachers strongly disagreed. So, some of the instructors are not competent and updated in their subjects' matter and training delivery.

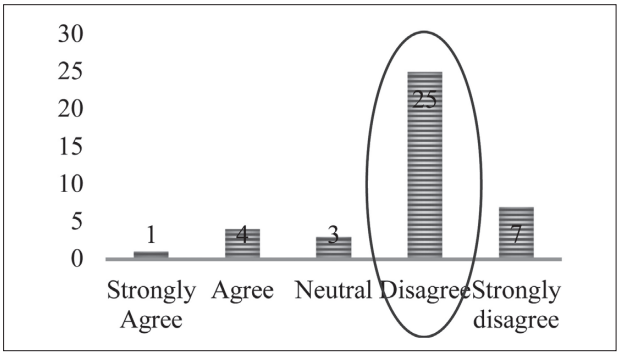

Figure 6: Teachers' opinion towards instructors' competencies
Source: made by the author

4.5 There is biasness in evaluation

There is the provision of an evaluation system of the teachers according to their involvement in the training workshops and the performance in teaching-learning activities. But in this study most of teachers said that there is no fair evaluation system and then there is biasness in rewarding and punishment.Fig.7, shows that there were thirty-three respondents impressed that there is biasness in evaluation, reward and punishment.

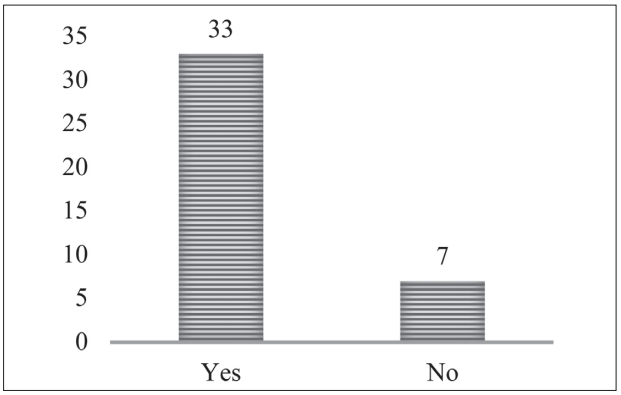

Figure 7: Biasness of teachers' evaluation
Source: made by the author

After finishing the training, instructors should have to go to the schools and supervise the classroom teaching and support the teachers in their teaching-learning activities. When the author took an interview

and let them fill out the questionnaire about the statement that there are regular monitoring and supervision. Most of the teachers said that no one is coming to school for supervision and monitoring. Among the respondents, 63% said there is "No" regular monitoring and supervision.

4.6 Teachers focus on students' activities and implementation of knowledge and skills, which are learnt from training workshop.

Eighteen types of questions were asked regarding application of training contents in classrooms. Such as; were there objectives of lesson clearly described? Was the lesson started through a story problem in the beginning? Was there appropriate use of teaching-learning materials? Did the teacher follow the student-centered activities? And so on.

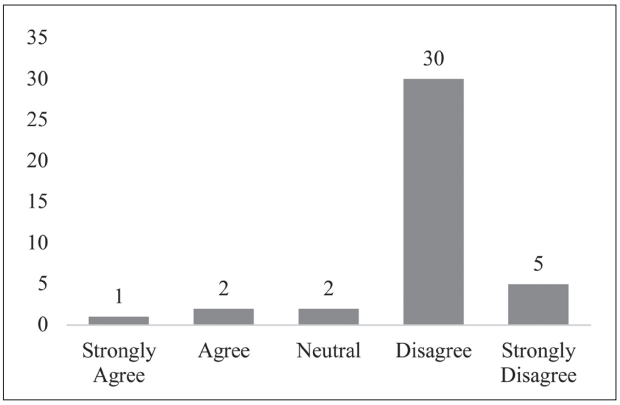

Figure 8: Application of training contents in classroom teaching
Source: made by author

Fig.8 shows that thirty teachers have disagreed and five teachers have strongly disagreed out of forty respondents in the above type of questions. That implies the most of the teachers are not transforming knowledge and skills in the classroom teaching, which were learnt from the training workshop.

4.7 Summary of interview

The interview was taken by asking open ended questions such as 1) what are the factors that make trainees passively participate in the training workshop? 2) What are the reasons why training is not employed in classroom teaching? 3) What can make trainees actively participate in training workshop? And 4) what are the appropriate ways to employ the contents of training in classroom teaching?

The summary of the answers, which were driven from the respondents are proceeded by coding and categorization in the following table (Table 1).

It was found that most of the respondents mentioned that i) the training curriculum and contents are not made from teachers' real problems and students competencies, ii) training delivery methods are not activity based, iii) most of the session conducted by power point presentation, not using relevant teaching learning materials, iv) instructors also are less updated and less competent in their subject maters and training delivery skills. In addition, according to their opinions, there is still biasness in evaluation between the teachers, no regular supervision and feedback. These comments are

Table 1: Trainees' opinions about training

Interviewee	Summary of transcripts	Codes	Categories
Primary math teachers, who attended in first phase and second phase of TPD training	Trainings curriculum and contents are made by ETC, not focusing on teachers' real needs. Most of the trainings are conducted not by using appropriate teaching materials but only power point presentation. Some of the training delivery methods are not focused on activity based. The trainers are less updated and less competent in their subject matters and facilitation skills. The training opportunities are not given equally to all teachers. Instructors do not visit schools to observe teacher's classroom teaching regularly. There is no fair evaluation between trained teachers and untrained teachers. The government offers low salary and denies to give other allowance, e.g., payment for training to teachers. The training centers are not accessible for all teachers.	- Training curriculum and contents - Training delivery - Power point presentation - Training materials - Salary and allowances - Competent - Facilitation skills - Observation - Evaluation - Access	- Training curriculum and contents - Training delivery - Teaching learning materials - Monitoring and supervision - Reinforcement

Source: summarized by author.

mainly related to intrinsic motivation issues and the ETC needs to consider reform about TPD training system and contents. The salaries and training allowances are very low. The training centers are not accessible for all teachers, who are living in remote areas. The teachers' salary, training allowances, fair evaluation, training access are categorized in the 'reinforcement' by author in Table 1.

5. Limitation of the study

This study was limited to certain area of an education training center. Only 40 primary mathematics teachers were chosen from forty schools. It only focused on two variables which include active participation in training workshop of mathematics and implementation of training in classroom teaching. There are various factors which would improve the students' learning achievement in mathematics. However, this study is only focused on how teacher training of mathematics has been perceived by trainees and what kind of reform could be applied to solve issues of training itself.

6. Discussion and Conclusion

From the trainees' point of view, it was found that the training curriculum and contents were not being made on the basis of teachers' and students' real needs. The training packages and training curriculum are made through the top-down approach which can't meet the teacher's real needs. The training materials, which are used in the training workshop, cannot be useful to use in classroom teaching. The trainers do not develop low cost and no-cost materials. Most of the materials are bought from the market. The training delivery was not completely participants centered. Some instructors always use Power Point. They don't focus on using hands-on materials and visualization of the mathematical problems. The instructors were not updated and competent in their subject matter. They were not well prepared for their presentations. They were eager to use old one set of prepared slides, which were already used and outdated. There were not affordable allowances. That is why the teachers do not want to participate actively in the training workshops. Moreover, it was found that there is no regular monitoring and supervision in the classroom teaching. The instructors only reach schools sometime, but they don't take deep consideration of classroom supervision. Most of the teachers are happy to follow their own traditional teaching ways. That is why the knowledge and skills, learnt from training are not transformed in classroom teaching.

In conclusion, in order to improve intrinsic motivation of trainees, who can change the mathematics teaching and learning activities in classroom, the author would like to suggest that mathematics training curriculum should be made on the basis of teachers' and students' real needs. The training resource materials should be made after deep discussion with mathematics experts and the teachers. Trainers should be updated and competent to their subject matters. It is necessary to follow activity-based training delivery methods (i.e., not only Power Point Presentations) and establish the reinforcement, not only training workshops but also in teaching-learning activities. It is necessary to focus on using low cost and no cost teaching learning materials, which are available in the localities. The classroom monitoring and supervision should be strongly applied. There should be continuous technical reinforcement and feedback to the teachers. It is necessary to recruit special math subject teachers, not general subject teachers for teaching math subjects and to remove biasness in evaluation. The instructor, teachers and other stakeholders should be responsible with their responsibilities and duties. It will take time to adopt new strategies in teaching learning activities, but it is necessary to be patient and try to apply them continuously. Teacher should prepare enough hands-on materials, which students can easily understand and manipulate. It is also recommendable to apply in-school teacher training; like Lesson Study[1] strategies to improve constantly teachers' skills to prepare and deliver mathematics lessons.

[1] The idea is simple: "teachers organically come together with a shared question regarding their pupils' learning, plan a lesson to make pupil learning visible, and examine and discuss what they observe. Through multiple iterations of the process, teachers have many opportunities to discuss pupil learning and how their teaching affects it" (Murata, 2011, p. 2).

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